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(54) PRACTICE GOLF BALL

(71) I, PHILIP JOHN ILINE, a British Subject of 24, Barfield Road, Bickley, Kent, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to practice golf balls, that is to say balls of a similar size to standard golf balls which are used by golfers for the purpose of practising golfing strokes, (and in particular drives), rather than for the purpose of a game of golf proper.

A prime requisite of such a ball is that, when struck, it will not be driven as far as would an unrestrained standard golf ball struck with a similar stroke in order that a golfer may practice in a relatively confined area, to alleviate the task of retrieving the ball after it has been struck, and to safeguard non-participants when practising in a public area. Thus, it has previously been proposed to employ as a practice ball a standard golf ball provided with some additional retarding means such as a line tethered to the ground, or a parachute. However, a number of factors militate against the practicability of such "balls", including their danger in the event of the failure of the retarding means, their complexity and expense, and the fact that due to the need for a staple or some other attachment means to be fixed with the actual ball, the ball has to be oriented in a particular manner before it can be struck. The present invention is accordingly concerned with a "free flying" practice ball which depends for retardation solely upon the aerodynamic drag and, (when rolling), the ground drag of the ball itself.

Balls of this nature are presently available to golfers, all types known to me comprising a spherical skin of plastics material having an external diameter substantially equal to that of a standard golf ball, the skin being provided with a plurality of apertures for the purposes of lending a high aerodynamic drag to the ball.

Another important consideration if a

practice golf ball is to be of use in improving the strokes of a golfer practising therewith is that the sensation felt by the golfer when striking the ball with any particular club should simulate the sensation he feels when striking a standard golf ball with a similar stroke. This sensation is believed to largely depend upon a combination of the weight of the ball and its compression stiffness, contributory factors including the state of the surface of the ball as well as "external" cues such as the sound made by the impact of club and ball.

Furthermore, a practice golf ball should preferably be at least as resistant to mis-hitting and other abuses as is a standard golf ball.

The apertured type of practice ball mentioned above whilst admirably fulfilling the requirements of rapid retardation is, however, only of limited use to the golfer who wishes to improve his strokes by practising therewith, due to the poor correlation between the "feel" to the golfer of the practice ball when struck with a similar stroke. This in turn is thought to be due to the extremely light weight and the low compression stiffness of the practice ball in comparison with the standard ball; furthermore, because of the presence of apertures in the practice ball it may not be struck at an even surface, and yet again the sound made by the impact of a club with the practice ball is not of the same quality or definition as that obtained with a standard ball. In addition, such practice balls can be permanently deformed if, for example, compressed between a club and the ground when mis-hit.

The present invention thus seeks to provide for a "free flying" practice golf ball having all of the attributes discussed above and, in particular, to provide for such a ball which, when struck, can simulate more closely than the apertured type of practice ball described above the sensation felt by a golfer when striking a standard golf ball with a similar stroke.

Accordingly, in its broadest aspect the invention provides a practice golf ball

which is lighter than a standard golf ball, the practice ball consisting of a homogenous solid (i.e. non-hollow) body of an expanded copolymer of ethylene and vinyl acetate.

5 The homogenous solid body preferably contains no filler and no plasticizer.

The practice golf ball of the invention is lighter than a standard golf ball in order that it may be quickly retarded by its aerodynamic and ground drag. The practice golf ball of the invention also has a greater compression stiffness than the apertured type of practice ball described above. Thus the ball, when struck, will more closely simulate the sensation felt by a golfer when striking a standard golf ball with a similar stroke than can the apertured type of ball, the ball being far more resistant to permanent deformation by compression than the apertured type of ball.

There are two standard golf balls in use today: the "British", with a nominal diameter of 1.62 inches and a nominal weight of 1.62 ounces (46 grams) and the "American", with a nominal diameter of 1.68 inches and a nominal weight 1.62 ounces, and a ball according to the present invention may be made with either diameter. The surface of a ball according to the invention may be formed with dimples to resemble the surface of a standard golf ball, and the ball will normally be white as is a standard golf ball. However, a ball may be produced in any colour or with any other surface markings which may be desired.

The practice golf ball of the invention may have a diameter of substantially 1.62 inches and weigh substantially 16 gms (0.564 ounces) or may have a diameter of substantially 1.68 inches and weigh substantially 17 gms (0.600 ounces). A ball according to the invention may advantageously be made by an injection moulding process. The copolymer is in an expanded form in order to obtain desirable weight and stiffness characteristics and, in addition, the incorporation of a blowing agent assists in reducing the incidence of internal stresses in the ball which would otherwise be set up by the uneven cooling of the ball after moulding and which could result in the ball shattering when struck.

By way of a specific example, a practice golf ball according to the invention and corresponding to a "British" standard golf ball, (that is to say of approximately 1.62 inches diameter), is injection moulded from a low density copolymer of ethylene and vinyl acetate, containing 7.5% by weight of vinyl acetate units and 92.5% by weight of ethylene units, with the addition of 0.65% by weight of the blowing agent marketed by Fisons Limited under the name of "Genitron". EPC. (The word "Genitron" is a

Trade Mark). The ball is a homogenous solid body and weighs approximately 0.56 ounces (i.e. approximately 25% of the weight of the standard golf ball); in the absence of the blowing agent the weight would be approximately double. The ball is white in appearance and the mould is so configured that the surfaces of the ball closely resembles the surface of a standard golf ball, it having 310 frustospherical dimples of $\frac{3}{16}$ inch radius each presenting a diameter of 0.12 inches on the ball surface. There is a good correlation between the "feel" of the ball when struck and the "feel" of a standard golf ball when struck with a similar stroke, and the sound made by the impact of a club with the ball closely resembles the sound made by the impact of the club with a standard golf ball. The coefficient of restitution for an ordinary golf ball (British) was determined at 0.76, and that for the practice golf ball according to the invention as 0.52. According to estimates the practice ball can only be driven approximately 30% of the distance that a standard golf ball can be driven with a similar stroke. In addition, the practice ball is virtually indestructible even if abused and the surface is considerably more resistant to damage than is the thin outer skin of a standard golf ball.

WHAT I CLAIM IS:—

1. A practice golf ball which is lighter than a standard golf ball, the practice ball consisting of a homogenous solid body of an expanded copolymer of ethylene and vinyl acetate.
2. A ball according to Claim 1, having a diameter of substantially 1.62 inches.
3. A ball according to Claim 2, the ball weighing substantially 16 gms.
4. A ball according to Claim 1 having a diameter of substantially 1.68 inches.
5. A ball according to Claim 4, the ball weighing substantially 17 gms.
6. A practice golf ball according to any preceding claim, wherein the homogenous solid body contains no filler and no plasticizer.
7. A practice golf ball according to any preceding claim, wherein the surface of the homogenous solid body is dimpled so that the ball resembles a standard golf ball in appearance.
8. A practice golf ball according to any preceding claim, the ball having been made by injection moulding.
9. A practice golf ball substantially as described herein by way of example.

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